

- 1965 First seen 15 May. All body feathers black; bib much brighter than in previous years; very little flecking on breast, but heavy black flecks on sides and flanks, with some buffy wash; rump gray. Photographed 30 May. This bird is now five years old.  
The bib has retained the same general shape and size throughout the period—quite narrow below the black throat, with a long, thin “tail”.

I can find nothing in the literature regarding age differences in female plumages (i.e., subadult and adult), although birds of the year are, of course, identifiable. I have not observed female plumages as closely as male plumages, but I have noted differences in shades of brown, marked differences in amount and intensity of breast streaks, variations in amount of buff or yellow on upper breast (some are almost pure white), and the color of the axillars which varies from yellow through salmon, with a mixture of both in some cases. I have no indication as yet that age of females can be determined by any of these plumage variations. Returns on females have been much lower than on males, so it has been impossible to get a good succession of plumages for the same bird. I might mention here that in 1964 I banded a partial albino female which appeared only once at my feeder, when it was trapped and photographed. I have three color photographs of this strikingly handsome bird.

I have also been able to take pictures of several males in various stages of postnuptial molt, and one in full winter plumage.

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**Reaction of the Starling (*Sturnus vulgaris*) to hard, fatty foods.**—Swarming to feeding stations during severe winter weather, Starlings often consume in minutes supplies that would last other birds many hours. This is particularly true if favored Starling foods are supplied. Fats, bakery products, and fruits are, as a rule, better received than seeds and grain. Sunflower seed are scarcely touched at all. A relatively weak-billed bird, the Starling is poorly equipped for pounding open objects. Its habit, therefore, seems to be mainly that of seeking out large supplies of easily obtainable food, and when these are exhausted, it moves on. With the exception of sunflower seed, most feeding station foods are well within the Starling's capacity to down quickly. No food is probably eaten with more relish or quicker than the various combinations of peanut butter, cornmeal, and suet so popular at feeders as an all-around bird food. However, with proper proportioning of each ingredient, the suet-cornmeal mix can be made so hard under cold weather conditions that it is almost impervious to Starling attack. Adding cornmeal and suet, or even finely cracked corn, at the expense of peanut butter, seems to make a harder combination that is resistant to Starlings but well within the capacity of other feeding station visitors. I found that a mixture composed of 1 part peanut butter, 2 parts melted beef suet, 4 parts finely cracked corn, and 4 parts white cornmeal greatly slowed Starling consumption in cold weather (Dennis, 1963a, 1963b). In a continuation of experiments with hard fatty foods, seven mixtures were tested between 16-22 January, 1965, a period of cold snowy weather

during which hundreds of Starlings were present at my feeders near Leesburg, Virginia. As earlier, I found that any one of several fat combinations was resistant to Starling attack. The two most effective combinations were (1) 2 parts melted suet to 3 parts white cornmeal, and (2) 2 parts bacon drippings to 3 parts white cornmeal. All test combinations were made available in tin can containers. Sunflower seed, as well as fat mixtures, were supplied during the period.

Although only hard-to-get-at foods were supplied, Starlings continued to frequent the vicinity of the feeders as long as the cold and snow persisted. Moreover they began to use tactics that alarmed and confused other feeding station visitors and to the extent that the normal feeding pattern was disrupted. The watchful Starlings became aware that certain visitors, by heavy pounding against the solidified fat mixtures, scattered fragments of food about the feeding shelves. Individuals of species that broke and scattered appreciable amounts of food began to be closely watched and attended by Starlings. Species that scattered the most food and which hence received the most attention from Starlings were Yellow-bellied Sapsucker, Red-bellied Woodpecker, Yellow-shafted Flicker, and Blue Jay. Generally ignored by the Starlings were smaller birds which were as much gleaners of food as they were distributors. Among these were Carolina Chickadee, Tufted Titmouse, Carolina Wren, and House Sparrow. The Downy Woodpecker, which tended to scatter only minute bits of food, received only mild attention from Starlings.

Although feeding trays were not constantly occupied by Starlings through the day, there were always Starlings perched upon the limbs of nearby trees. Without easily accessible food, Starlings remained relatively inactive and watchful. Individuals now and then pecked at a test mixture or even picked up and dropped a few sunflower seed. But, for the most part, the Starlings awaited a visit by one of the larger birds that tended to scatter tidbits. As soon as such a bird approached, one or more Starlings would take up position nearby. If the approaching bird wasn't scared away, the waiting starlings would draw ever nearer and begin to pick up the tidbits that were scattered about on the tray. Other tidbits that fell to the snow on the ground below, with few exceptions, were ignored by Starlings but were retrieved by such birds as Slate-colored Junco, Cardinal, White-throated Sparrow, Rufous-sided Towhee, Carolina Wren, Carolina Chickadee, and Tufted Titmouse.

Unfortunately equitable distribution of food by means of a provider-gleaner system was disrupted by the failure of most larger birds to feed once they found themselves attended by Starlings. Either the larger bird would retreat without eating or engage a Starling in violent combat. Numerous engagements were witnessed between Red-bellied Woodpeckers and Starlings. Invariably the woodpecker was defeated and often ignominiously so. Individual Red-bellied Woodpeckers and Sapsuckers were seen to be turned over on their backs and pounded by a Starling's bill. So "Starling shy" did many of the larger visitors become that they deserted the trays altogether if Starlings were around.

In no instance was a Starling seen to attack another species without provocation. Interspecific conflicts were entirely a result of "misinterpretation" of the Starling's motive. That a waiting, crouching Starling appears as an aggressor to other birds is not surprising. Human observers, too, mistake the Starling as a feeding station aggressor. Although its role is generally much more innocent, the Starling, nevertheless, is a disruptive force at feeding stations. A remedy to the situation should consist not only in providing hard-to-get-at foods, but also in "Starling-proof" feeders. Wandrus and Wandrus (1961) describe a simple suet feeder that is said to be highly effective in thwarting Starling competition.

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